Claims

1. (Original) A porous silica granule approximately spherical in shape, having a carbon concentration of less than 1 wt.-ppm, a pore volume of 0.5 cm^3 or less per
1 gram of the granules, a mean diameter of pores of 50 nm or less, a specific surface area of 100 m^2/g or less, and a bulk density of 0.7 g/cm^3 or higher.

2. (Original) A porous silica granule as claimed in Claim 1, wherein the water content thereof is a maximum of about 1% by weight.

3. (Original) A porous silica granule as claimed in Claim 1, wherein the particle diameter of the porous silica granule is in a range of from 50 to 800 μm.

4. (Amended) A ~~method for producing~~ porous silica granule ~~granules~~, according to claim 1, produced according to a method comprising dispersing a fumed silica obtained by hydrolysis of a silicon compound into pure water to obtain a slurry having a solid concentration of from 50 to 80 % by weight; controlling the pH value of the slurry to a range of from 1 to 4; and, while stirring, drying the slurry until the water content thereof is a maximum of about 20% by supplying a heated dying gas to obtain the porous silica granule ~~granules~~.

5. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein the drying gas is supplied to the slurry until the water content thereof is a maximum of about 1%.

6. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein the drying gas is heated to a temperature range of from 80 to 150 °C.

7. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein the particle diameter of the fumed silica is a maximum of about 4 μm or less.

8. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein the solid concentration of the slurry is in a range of from 60 to 70 % by weight,

and the pH value is in a range of from 2 to 3

9. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein the rate of evaporating water by supplying heated gas is 50 g/hour or lower per 1 kg of the initial slurry.

10. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein the porous silica ~~granules are~~ is classified in a classification step.

11. (Amended) A ~~method~~ porous silica granule as claimed in Claim 10, wherein the particle diameter of the silica ~~granules~~ granule obtained by classification is in a range of from 180 to 500 μm

12. (Amended) A ~~method~~ porous silica granule as claimed in Claim 4, wherein a silicon compound free from carbon atoms is used.

13. (Amended) A method for producing a porous silica granule according to claim 1 ~~granules, obtained by a sol-gel method~~ comprising preparing a wet gel body by reacting high purity alkoxysilane with water; drying the resulting body and size-reducing it thereafter; and applying a purification treatment.

14. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 1, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and
- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

15. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 2, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

16. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 3, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

17. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 4, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an

oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

18. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 5, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

19. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 6, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous

hydrogen or gaseous helium.

20. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 7, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and
- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

21. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 8, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and
- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

22. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 9, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

23. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 10, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

24. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 11, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

25. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 12, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

26. (Original) A method for producing high purity synthetic quartz glass powder by using porous silica granules obtained by the production method as claimed in Claim 13, comprising

- a step of heat treatments, comprising performing a first heat treatment by heating said silica granules in a temperature range of from 150 to 300 °C under an oxygen-containing atmosphere, a second heat treatment of heating in a temperature range of from 600 to 1100 °C, and a third heat treatment in a temperature range of from 1100 to 1300 °C under an atmosphere containing hydrogen chloride; and

- a step of densification, comprising calcining the silica granules at a temperature not higher than 1500 °C under vacuum or in an atmosphere of gaseous hydrogen or gaseous helium.

27. (Original) A method as claimed in Claim 14, wherein the calcining is performed in the temperature range of from 1300 to 1500 °C.

28. (Original) Method as claimed in claim 14, wherein calcining comprises performing bubbling fluidization of said porous silica granules by supplying gaseous helium and calcining thereof in a temperature range of from 1300 to 1600 °C.

29. (Original) Method as claimed in Claim 28, wherein gaseous helium is supplied after it is heated to at least 600 °C.

30. (Original) Method claimed in Claim 28, wherein gaseous helium is circulated.

31. (Original) Method claimed in Claim 29, wherein gaseous helium is circulated.

32. (Original) A method for producing high purity synthetic quartz glass, comprising fusing and vitrifying the high purity synthetic quartz glass powder obtained by the production method claimed in Claim 13.

33. (Original) A method for producing high purity synthetic quartz glass, comprising fusing and vitrifying the high purity synthetic quartz glass powder obtained by the production method claimed in Claim 14.

34. (Original) A method for producing high purity synthetic quartz glass, comprising fusing and vitrifying the high purity synthetic quartz glass powder obtained by the production method claimed in Claim 27.

35. (Original) A method for producing high purity synthetic quartz glass, comprising fusing and vitrifying the high purity synthetic quartz glass powder obtained by the production method claimed in Claim 28.

36. (Original) A method for producing high purity synthetic quartz glass, comprising fusing and vitrifying the high purity synthetic quartz glass powder obtained by the production method claimed in Claim 29.

37. (Original) A method for producing high purity synthetic quartz glass, comprising fusing and vitrifying the high purity synthetic quartz glass powder obtained

by the production method claimed in Claim 30.

38. (Previously Added) A method for producing a porous silica granule approximately spherical in shape, having a carbon concentration of less than 1 wt.-ppm, a pore volume of 0.5 cm^3 or less per 1 gram of the granules, a mean diameter of pores of 50 nm or less, a specific surface area of 100 m^2/g or less, and a bulk density of 0.7 g/cm^3 or higher, comprising dispersing a fumed silica obtained by hydrolysis of a silicon compound into water to obtain a slurry, and drying.

39. (Previously Added) The method according to claim 38, wherein the silica obtained by hydrolysis of a silicon compound is dispersed into pure water to obtain a slurry having a solid concentration of from 50 to 80 % by weight; further comprising the steps of controlling the pH value of the slurry to a range of from 1 to 4; and, while stirring, drying the slurry until the water content thereof is a maximum of about 20% by supplying a heated dying gas to obtain the porous silica granules.

40. (Previously Added) A porous silica granule produced according to the method of claim 4, which is approximately spherical in shape, having a carbon concentration of less than 1 wt.-ppm, a pore volume of 0.5 cm^3 or less per 1 gram of the granules, a mean diameter of pores of 50 nm or less, a specific surface area of 100 m^2/g or less, and a bulk density of 0.7 g/cm^3 or higher.